

POWER SYSTEM

Robert Cataldo (NASA GRC)
Myron Hill (NASA GRC)
Thomas Labus (NCMR)
Thomas Radcliffe (University of Akron)
Subramanian Sankaran (NCMR)

Vijay Dhir (UCLA)
Steve Johnson (NASA GRC)
Kevin Miller (Lockheed Martin Astronautics)
Robert Reid (Los Alamos National Laboratory)

Driving “Requirements” Related to Microgravity

- Minimize system mass, area and volume
- Long life regenerative fuel cells (>10,000 hours)
- Heat pipe start up and operation
- Liquid metal reactor start up and operation (for Brayton or Rankine conversion cycles)
- Battery sensitivity to low-g –thermal driven gradients

Power Working Group

Research Areas (not in priority order)	AMTEC	Batteries	Fuel Cells	LMCR	Heat Pipes	Rankine Power Conversion	Brayton Power Conversion	Stirling Power Conversion
▪ Liquid metal melting/solidification				X	X	X		
▪ Two-phase and heat transfer (including liquid metals)								
- Flow regime prediction						X		
- Boiling heat transfer and evaporation	X		X	X	X	X		
- Condensation heat transfer	X				X	X		
- Phase separation			X			X		
- Flow instabilities			X			X		
- Interfacial phenomena			X		X	X		
- Two phase flow in porous media	X		X		X			
- Working fluid distribution	X				X			
- Wetting/de-wetting	X				X			
- Capillary flow issues			X		X			
▪ NC gas generation and management		X						
▪ Thermal gradients in re-charge batteries		X						
▪ Humidification and control			X					
▪ Materials compatibility (not gravity dependent)	X			X	X	X	X	
▪ Dust accumulation on radiators						X	X	X
▪ Systems models								